

## EXECUTIVE SUMMARY

Thank you for your continued hard work sampling **Snake River, New Hampton** this year!

The Snake River is located between Lake Winona and Lake Waukegan. Specifically, the Snake River begins at the Outlet of Lake Winona and flows to the inlet of Lake Waukegan. A youth summer camp and canoe launch site are located along the Snake River near the entrance to Lake Waukegan

The concerned residents, who initiated contact with the DES Limnology Center about the possible impacts of a commercial summer camp, have been monitoring Snake River since 2002. Thank you for your continued hard work sampling Snake River and dedication to keeping Lake Waukegan healthy! It is dedicated volunteers like you who spend their time and energy monitoring watershed events that keep New Hampshire's surface waters clean!

We encourage your monitoring group to formally participate in the DES Weed Watchers program, a volunteer program dedicated to monitoring lakes and ponds for the presence of exotic aquatic plants. This program only involves a small amount of time during the summer months. Volunteers survey their waterbody once a month from **May** through **September**. To survey, volunteers slowly boat, or even snorkel, around the perimeter of the waterbody and any islands it may contain. Using the materials provided in the Weed Watcher kit, volunteers look for any species that are suspicious. After a trip or two around the waterbody, volunteers will have a good knowledge of its plant community and will immediately notice even the most subtle changes. If a suspicious plant is found, the volunteers immediately send a specimen to DES for identification. If the plant specimen is an exotic species, a biologist will visit the site to determine the extent of the problem and to formulate a management plan to control the nuisance infestation. Early detection is the key to controlling the spread of exotic plants.

If you would like to help protect your lake or pond from exotic plant infestations, contact Amy Smagula, Exotic Species Program Coordinator, at 271-2248 or visit the Weed Watchers website at [www.des.nh.gov/organization/divisions/water/wmb/exoticspecies/weed\\_watcher.htm](http://www.des.nh.gov/organization/divisions/water/wmb/exoticspecies/weed_watcher.htm).







## TRIBUTARY SAMPLING

### ➤ **Total Phosphorus**

Table 14 in Appendix A presents the current year total phosphorus data for tributary stations. Please refer to the “Chemical Monitoring Parameters” section of the report for a detailed explanation of total phosphorus.

The phosphorus concentrations at **Sites 3 and 4** on the **June** sampling event were **slightly elevated (17 and 15 ug/L)**, and the turbidities were also **slightly elevated (1.25 and 1.3 NTUs)**. Elevated turbidity levels are most often a result of sediment and/or organic material present in the sample. These materials typically contain attached phosphorus and when present in elevated amounts contribute to elevated tributary phosphorus levels.

### ➤ **pH**

Table 14 in Appendix A presents the current year pH data for the tributary stations. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation of pH.

The pH of the tributary stations ranged from **5.95 to 6.37 (> 6)** and is sufficient to support aquatic life.

### ➤ **Conductivity**

Table 14 in Appendix A presents the current conductivity data for the tributary stations. Please refer to the “Chemical Monitoring Parameters” section of the report for a more detailed explanation of conductivity.

The **Snake River** has experienced slightly elevated conductivity levels since monitoring began. We recommend that your monitoring group conduct a conductivity survey of tributaries with **elevated** conductivity and along the shoreline of the pond to help identify the sources of conductivity. As previously mentioned increasing conductivity typically indicates the influence of pollutant sources associated with human activities.

*For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>, or contact the VLAP Coordinator.*

*To learn how to conduct a shoreline or tributary conductivity survey, please refer to the 2004 special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>.*



***publications.htm***, or contact the VLAP Coordinator.

It is possible that de-icing materials applied to nearby roadways during the winter months may be influencing the conductivity in the river. In New Hampshire, the most commonly used de-icing material is salt (sodium chloride).

Therefore, we recommend that the **Snake River** be sampled for chloride next year. This additional sampling may help us identify what areas of the watershed are contributing to the increasing in-lake conductivity.

*Please note that the DES Limnology Center in Concord is able to conduct chloride analyses, free of charge. As a reminder, it is best to conduct chloride sampling in the spring as the snow is melting and during rain events.*

### ➤ **Turbidity**

Table 14 in Appendix A presents the current year turbidity data for the tributary stations. Please refer to the “Other Monitoring Parameters” section of the report for a more detailed explanation of turbidity.

Overall, **2008** tributary turbidity levels were **similar** to historical tributary turbidity levels.

### ➤ **Bacteria (*E. coli*)**

Table 14 in Appendix A lists the current year data for bacteria (*E.coli*) testing. *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E.coli* is used as an indicator organism because it is easily cultured and its presence in the water, in defined amounts, indicates that sewage **may** be present. If sewage is present in the water, potentially harmful disease-causing organisms **may** also be present. Please refer to the “Other Monitoring Parameters” section of the report for a more detailed explanation.

Bacteria sampling was not conducted this year. If residents are concerned about sources of bacteria such as failing septic systems, animal waste, or waterfowl waste, it is best to conduct *E. coli* testing when the water table is high, when beach use is heavy, or immediately after rain events.

### ➤ **Chlorides**

Table 14 in Appendix A lists the current year data for chloride sampling. The chloride ion (Cl-) is found naturally in some surface waters and groundwaters and in high concentrations in seawater. Research has shown that elevated chloride levels can be toxic to freshwater aquatic life. In order to protect freshwater aquatic life in New Hampshire, the state has adopted **acute and chronic** chloride criteria of **860 and 230 mg/L** respectively. The chloride



content in New Hampshire lakes is naturally low, generally less than 2 mg/L in surface waters located in remote areas away from habitation. Higher values are generally associated with salted highways and, to a lesser extent, with septic inputs. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

Chloride sampling was **not** conducted during **2008**.

## **DATA QUALITY ASSURANCE AND CONTROL**

### **Annual Assessment Audit:**

An annual assessment audit was not conducted in 2008. Please contact the VLAP Coordinator to schedule a biologist visit in 2009.

### **Sample Receipt Checklist**

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if your group followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, improper sampling techniques.

Overall, the sample receipt checklist showed that your monitoring group did an **excellent** job when collecting samples and submitting them to the laboratory this year! Specifically, the members of your monitoring group followed the proper field sampling procedures and there was no need for the laboratory staff to contact your group with questions, and no samples were rejected for analysis.



## USEFUL RESOURCES

*Acid Deposition Impacting New Hampshire's Ecosystems*, DES fact sheet ARD-32, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-32.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-32.pdf).

*Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials*, DES Booklet WD-03-42, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-03-42.pdf](http://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-03-42.pdf).

*Impacts of Development Upon Stormwater Runoff*, DES fact sheet WD-WQE-7, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/aot/documents/wqe-7.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/aot/documents/wqe-7.pdf).

*Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes*, DES fact sheet WD-BB-9, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-9.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-9.pdf).

*Proper Lawn Care In the Protected Shoreland, The Comprehensive Shoreland Protection Act*, DES fact sheet WD-SP-2, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-2.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-2.pdf).

*Road Salt and Water Quality*, DES fact sheet WD-WMB-4, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-4.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-4.pdf).

*Shorelands Under the Jurisdiction of the Comprehensive Shoreland Protection Act*, DES fact sheet SP-4, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-4.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-4.pdf).

*Through the Looking Glass: A Field Guide to Aquatic Plants*, North American Lake Management Society, 1988, (608) 233-2836 or [www.nalms.org](http://www.nalms.org).

*Weed Watchers: An Association to Halt the Spread of Exotic Aquatic Plants*, DES fact sheet WD-BB-4, (603) 271-2975 or [www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-4.pdf](http://www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-4.pdf).